Internation—pplication No PCT/EP 03/03983

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 F28F27/00 F28D9/00 According to International Patent Classification (IPC) or to both national classification and IPC **B. FIELDS SEARCHED** Minimum documentation searched (classification system followed by classification symbols) IPC 7 F28F F28D B01J Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, PAJ C. DOCUMENTS CONSIDERED TO BE RELEVANT Category 9 Citation of document, with indication, where appropriate, of the relevant passages Relevant to daim No. X EP 0 848 155 A (CUMMINS ENGINE CO INC) 1-4,6, 17 June 1998 (1998-06-17) 10,16, 18, 19, 27 abstract column 12, line 29 -column 16, line 56; figures 5-9 X PATENT ABSTRACTS OF JAPAN 1,3-5,vol. 009, no. 235 (M-415). 10,16, 21 September 1985 (1985-09-21) 18,19 -& JP 60 089685 A (UBE KOSAN KK). 20 May 1985 (1985-05-20) abstract; figures Further documents are listed in the continuation of box C. X Patent family members are listed in annex. Special categories of cited documents: 'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the "A" document defining the general state of the art which is not considered to be of particular relevance invention \*E\* earlier document but published on or after the International "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to "L" document which may throw doubts on priority claim(s) or which is clied to establish the publication date of another Involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the ort citation or other special reason (as specified) O' document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed in the art. "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 5 August 2003 11/08/2003 Name and mailing address of the ISA Authorized officer European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016 Van Dooren, M



Internation No
PCT/EP 03/03983

Category Chation of document, with indication, where appropriate, of the relevant passages    X	i No.
X US 3 047 274 A (WILSON WARREN M) 1,4,1 31 July 1962 (1962-07-31) 13,18 cited in the application 19,21	
31 July 1962 (1962-07-31) 13,18 cited in the application 19,21	
column 3, line 32 -column 5, line 73 column 10, line 30 -column 11, line 57 figures 1-4	,
P,X WO 02 087753 A (ASHE ROBERT ; ASHE MORRIS 1,2,7 LTD (GB); MORRIS DAVID (GB)) 11,13 7 November 2002 (2002-11-07) 18,19 cited in the application page 23, paragraph 2 - paragraph 3; claim 16; figures 10-12	,
DE 610 228 C (BERGEDORFER EISENWERK AKT GES) 6 March 1935 (1935-03-06) the whole document	
A WO 00 70292 A (ALFA LAVAL AB ;KAELLROT 1,2,1 MAGNUS (SE)) 23 November 2000 (2000-11-23) 11,14 16,22	0,
A US 4 993 367 A (KEHRER WOLFGANG) 19 February 1991 (1991-02-19) the whole document  1	

## INTERNATIONAL SEARCH REPORT Inform on patent family members

PC 12 O3/03983

Patent document P cited in search report		Publication date	Patent family member(s)		Publication date	
EP	0848155	A	17-06-1998	US DE EP EP	5732688 A 69720661 D1 1270921 A2 0848155 A2	31-03-1998 15-05-2003 02-01-2003 17-06-1998
JP	60089685	A	20-05-1985	NONE		
บร	3047274	A	31-07-1962	NONE		
WO	02087753	Α	07-11-2002	GB WO	2374947 A 02087753 A1	30-10-2002 07-11-2002
DE	610228	С	06-03-1935	NONE		
WO	0070292	A	23-11-2000	SE AU WO SE	514096 C2 4967600 A 0070292 A1 9901778 A	08-01-2001 05-12-2000 23-11-2000 18-11-2000
US	4993367	A	19-02-1991	DE DE EP JP	3828034 A1 58901025 D1 0356648 A1 2075895 A	22-02-1990 30-04-1992 07-03-1990 * 15-03-1990